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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,081

06/15/2006

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EXAMINER

BOYLE, ROBERT C

ART UNIT

PAPER NUMBER

4131

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DELIVERY MODE

10/28/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,081	Applicant(s) INO ET AL.	
	Examiner ROBERT C. BOYLE	Art Unit 4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/6/2007, 9/15/2006, 6/15/2006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 7-11, and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtin et al., U.S. Patent 6,150,426 in view of Schreyer et al., U.S. Patent 3,085,083.

3. Claim 1 discloses a fluoropolymer containing $-\text{CF}_2\text{H}$ endgroups and acid/acid salt groups where the acid salt group can be SO_3M , where M is a metal in group 1 or 2 in the periodic table. Curtin teaches a fluoropolymer with a SO_3M group where M can be Na (column 3-4, lines 57-43). Curtin does not teach $-\text{CF}_2\text{H}$ endgroups.

4. Schreyer teaches the formation of fluoropolymers with $-\text{CF}_2\text{H}$ endgroups (column 2, lines 60-67). One of ordinary skill in the art at the time the invention was made would have been motivated to modify the fluoropolymer in Curtin with the endgroups taught in Schreyer because terminating the polymer in a $-\text{CF}_2\text{H}$ endgroup adds to the thermal stability and corrosion resistance of the polymer, see Schreyer, columns 1-2, lines 69-24. Therefore, the invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

5. Claim 2 discloses the fluoropolymer having $-\text{CF}_2\text{O}_2\text{X}$ at the chain terminals, which are heat treated to yield $-\text{CF}_2\text{H}$ endgroups. Schreyer teaches this limitation (column 2, lines 28-67).

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6. Claim 3 discloses the acid salt group is a sulfonic acid group. Curtin teaches this limitation (column 3-4, lines 57-43).
7. Claim 4 discloses a method of producing the fluoropolymer of claim 1 where the fluoropolymer is subjected to heat treatment between 120°C to 400°C where the polymer has a SO₂Z group, where Z can be –OM and M can be a group 1 metal. Schreyer teaches heating the fluoropolymer above 200°C (column 3, lines 67-71). Curtin teaches a copolymer having units derived from a formula disclosed in claim 4 (column 3-4, lines 57-43).
8. Claim 5 discloses the heat treatment occurs between 120°C to 200°C in the presence of water. Schreyer teaches heating the polymer in the presence of water with temperatures between 200°C to 400°C (column 2, lines 14-21). The reference differs from claim 5 by failing to disclose an example falling within the claimed range, and by failing to disclose a range with sufficient specificity to anticipate the claimed range. However, the reference teaches a range that overlaps the claimed range, and it has been held that overlapping ranges are sufficient to establish *prima facie* obviousness. See MPEP 2144.05.
9. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected from the overlapping portion of the range taught by the reference because overlapping ranges have been held to establish *prima facie* obviousness.
10. Claim 7 discloses the fluoropolymer precursor is a copolymer. Curtin teaches this limitation (column 4, lines 36-43).
11. Claim 8 discloses structural details. Curtin teaches this limitation (column 3-4, lines 57-43).

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12. Claim 9 discloses the fluoropolymer precursor is a powder, dispersion, solution or membrane molding. Schreyer teaches the precursor as a slurry in water (column 3, lines 67-71).

13. Claim 10 discloses the fluoropolymer precursor is a membrane molding. Curtin teaches that the polymer can be used in membranes (column 9, lines 30-33).

14. Claim 11 discloses an electrolyte membrane comprising the fluoropolymer of claim 1. Curtin teaches that the polymer can be used in membranes and in electrolytic cells (column 9, lines 27-33).

15. Claim 15 discloses a membrane electrode assembly. Curtin teaches that the polymer can be used in membranes and in electrolytic cells (column 9, lines 27-33).

16. Claim 16 discloses a fuel cell comprising the membrane electrode assembly of claim 15. Curtin teaches that the polymer can be used in fuel cells, membranes, and in electrolytic cells (column 9, lines 27-33).

17. Claim 17 discloses a fuel cell comprising the membrane electrode of claim 11. Curtin teaches that the polymer can be used in fuel cells, membranes and in electrolytic cells (column 9, lines 27-33).

18. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatemoto et al., PCT Publication WO 2004/018527 in view of Schreyer et al., U.S. Patent 3,085,083. For the convenience of translation, references and citations will be made to the U.S. national stage document, U.S. Patent Application Publication No. 2005/0228127.

19. Claim 1 discloses a fluoropolymer containing $-\text{CF}_2\text{H}$ endgroups and acid/acid salt groups where the acid salt group can be SO_3M , where M is a metal in group 1 or 2 in the periodic table.

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Tatemoto teaches a fluoropolymer with a SO_3M group where M can be a group 1 metal (abstract). Tatemoto does not teach $-\text{CF}_2\text{H}$ endgroups.

20. Schreyer teaches the formation of fluoropolymers with $-\text{CF}_2\text{H}$ endgroups (column 2, lines 60-67). One of ordinary skill in the art at the time the invention was made would have been motivated to modify the fluoropolymer in Tatemoto with the endgroups taught in Schreyer because terminating the polymer in a $-\text{CF}_2\text{H}$ endgroup adds to the thermal stability and corrosion resistance of the polymer, see Schreyer, columns 1-2, lines 69-24. Therefore, the invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

21. Claim 2 discloses the fluoropolymer having $-\text{CF}_2\text{O}_2\text{X}$ at the chain terminals, which are heat treated to yield $-\text{CF}_2\text{H}$ endgroups. Schreyer teaches this limitation (column 2, lines 28-67).

22. Claim 3 discloses the acid salt group is a sulfonic acid group. Tatemoto teaches this limitation (paragraphs 0138-0139).

23. Claim 4 discloses a method of producing the fluoropolymer of claim 1 where the fluoropolymer is subjected to heat treatment between 120°C to 400°C where the polymer has a SO_2Z group, where Z can be $-\text{OM}$ and M can be a group 1 metal. Schreyer teaches heating the fluoropolymer above 200°C (column 3, lines 67-71). Tatemoto teaches a fluoropolymer having units derived from a formula disclosed in claim 4 (paragraphs 0138-0139).

24. Claim 5 discloses the heat treatment occurs between 120°C to 200°C in the presence of water. Schreyer teaches heating the polymer in the presence of water with temperatures between 200°C to 400°C (column 2, lines 14-21). The reference differs from claim 5 by failing to disclose an example falling within the claimed range, and by failing to disclose a range with sufficient

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specificity to anticipate the claimed range. However, the reference teaches a range that overlaps the claimed range, and it has been held that overlapping ranges are sufficient to establish *prima facie* obviousness. See MPEP 2144.05.

25. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected from the overlapping portion of the range taught by the reference because overlapping ranges have been held to establish *prima facie* obviousness.

26. Claim 6 discloses an organic solvent having compatibility with water and a boiling point between 100 and 300°C. Tatemoto teaches boiling water away from a fluoropolymer in the presence of methylpyrrolidone (paragraph 0181).

27. Claim 7 discloses the fluoropolymer precursor is a copolymer. Tatemoto teaches this limitation (paragraphs 0138-0139; 0146).

28. Claim 8 discloses structural details. Tatemoto teaches this limitation (paragraphs 0138-0139).

29. Claim 9 discloses the fluoropolymer precursor is a powder, dispersion, solution or membrane molding. Tatemoto teaches this limitation (paragraphs 0020-0021).

30. Claim 10 discloses the fluoropolymer precursor is a membrane molding. Tatemoto teaches fluoropolymers can be used in membrane molding (paragraphs 0002, 0007).

31. Claim 11 discloses an electrolyte membrane comprising the fluoropolymer of claim 1. Tatemoto teaches this limitation (paragraphs 0034-0035).

32. Claim 12 discloses an immobilized active substance material comprising the fluoropolymer of claim 1 and an active substance. Tatemoto teaches this limitation (paragraphs 0032-0033).

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33. Claim 13 discloses the active substance is a catalyst and claim 14 discloses the catalyst is a platinum containing metal. Tatemoto teaches these limitations (paragraphs 0194-0196).

34. Claim 15 discloses a membrane electrode assembly. Tatemoto teaches this limitation (paragraphs 0002-0003; 052-0053).

35. Claim 16 discloses a fuel cell comprising the membrane electrode assembly of claim 15. Tatemoto teaches this limitation (paragraphs 0002-0003; 0036-0037).

36. Claim 17 discloses a fuel cell comprising the membrane electrode of claim 11. Tatemoto teaches this limitation (paragraphs 0002-0003; 0036-0037).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT C. BOYLE whose telephone number is (571)270-7347. The examiner can normally be reached on Monday-Friday 9:00am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner
Art Unit 4131

/R. C. B./
Examiner, Art Unit 4131